In the Claims:

1. (Original) A method of incrementally updating a checksum in a network data packet header, the method comprising the steps of:

calculating a partial one's complement sum;

modifying at least one field of the network data packet header; and

adding a value to the partial one's complement sum to create an incrementally updated checksum.

2. (Original) The method of claim 1 wherein the step of calculating the partial one's complement sum includes subtracting an IP source address, an IP destination address, and a plurality of protocol bits from the checksum.

3. (Original) The method of claim 2 wherein the step of calculating the partial one's complement sum further comprises subtracting a source port and a destination port.

4. (Original) The method of claim 3 wherein the step of calculating the partial one's complement sum further comprises subtracting a sequence number and an acknowledgement number.

5. (Original) The method of claim 1 wherein the network data packet contains an IPv6 header having at least a source address, a destination address, and a next header field.

6. (Original) The method of claim 5 wherein the step of calculating the partial one's complement sum includes subtracting the source address, the destination address, and the next header field from the checksum.

7. (Currently Amended) A method of incrementally updating a checksum in a network data packet header, the method comprising the steps of:

receiving, at a packet processor, a data packet having a plurality of header fields comprising a source address, a destination address, and a plurality of protocol bits;

calculating a partial one's complement sum by subtracting from the checksum at least one of the header fields;

modifying at least one of the header fields to create a modified header;

adding to the partial one's complement sum a checksum value of the at least one modified header fields to obtain an <u>incrementally</u> updated checksum; and

transmitting the data packet having the modified header and <u>incrementally</u> updated checksum from the packet processor.

8.   (Original)   The method of claim 7 wherein the header fields further comprise a source port and a destination port.

9.   (Original)   The method of claim 8 wherein the header fields further comprise a sequence number and an acknowledgement number.

10.   (Original)   The method of claim 7 wherein the header fields are IPv6 header fields and comprise a source address, a destination address, and a next header field.

11.   (Currently Amended)   A method of incrementally updating a checksum in a network data packet header, the method comprising the steps of:

receiving, at a network switch, a data packet having a plurality of header fields comprising a source address, a destination address, a plurality of protocol bits, a source port, and a destination port;

calculating a partial one's complement sum by subtracting from the checksum the header fields;

modifying at least one of the header fields to create a modified header;

adding to the partial one's complement sum a checksum value of the modified header to obtain an <u>incrementally</u> updated checksum; and

transmitting the data packet having the modified header and <u>incrementally</u> updated checksum from the network switch.

12.   (Original)   The method of claim 11 wherein the header fields further comprise a sequence number and an acknowledgement number.

13.   (Original)   The method of claim 10 wherein the header fields are IPv6 header fields and comprise a source address, a destination address, and a next header field.

14.   (Currently Amended) A system for incrementally updating a network data packet checksum, the system comprising:

  an input parser configured to identify one or more header fields of an incoming data packet and to compute a partial one's complement sum from a reduced header part;

  a buffer memory for buffering the incoming data packet; and

  a circuit connected to the buffer memory for computing an <u>incrementally</u> updated <u>network</u> data packet checksum from a modified reduced header part and the partial one's complement sum.

15.   (Original) The system of claim 14 wherein the reduced header part comprises a source address, a destination address, and a plurality of protocol bits.

16.   (Original) The system of claim 15 wherein the reduced header part further comprises a source port and a destination port.

17.   (Original) The system of claim 16 wherein the reduced header part further comprises a sequence number and an acknowledgement number.

18.   (Original) The system of claim 14 wherein the reduced header part comprises a source address, a destination address, and a next header field.

19.   (Currently Amended) A system for incrementally updating a network data packet checksum, the system comprising:

  means for identifying one or more header fields of the incoming data packet;

  means for buffering the incoming data packet;

  means for computing a partial one's complement sum from a reduced header part<u>, and an incrementally updated network data packet checksum from the partial one's complement sum</u>; and

  means for transmitting the data packet <u>including the incrementally updated network data packet checksum</u> to its next hop.

20.   (Original) The system of claim 19 wherein the reduced header part comprises a source address, a destination address, and a plurality of protocol bits.

21.   (Original) The system of claim 20 wherein the reduced header part further

comprises a source port and a destination port.

22.   (Original) The system of claim 21 wherein the reduced header part further comprises a sequence number and an acknowledgement number.

23.   (Original) The system of claim 19 wherein the reduced header part comprises a source address, a destination address, and a next header field.

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